Prudential Regulation's Effect on Financial and Banking Stability: Empirical Study on the Algerian Banks

Zouaouia Hallam [(1)], Ahlem Aksa [(2)]

[1] Lecturer Class A, Faculty of Economics, Commerce and Management Sciences, University of Sidi Bel Abbes, Algeria, zouaouia.hallam@univ-sba.dz

[2] Lecturer Class A, Faculty of Economics, Commerce and Management Sciences, University of Sidi Bel Abbes, Algeria, ahlem.aksa@ univ-sba.dz

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Abstract :

This research aims to investigate the effects of prudential regulation and authority pressure on banks' and financial stability proxied by the z-score index. Running many panel data estimation techniques, we used a sample of 10 banks operating in the Algerian financial system over the period 2010-2020. Using variables such banking profitability; capital solvency; size and liquidity of banks; we obtained evidence that prudential regulations for Algerian banks can stabilize financial system. We find also that bank profitability has a significant impact. Empirical results conclude the index of solvency is not significant. Size and Liquidity of banks are both influencing financial stability negatively. Many empirical studies had the same findings. This study highlights importance of prudential measures taken by the authority of banks such reserve requirements; capital solvency and reforms in the banking system.

Mots clés:
Mot clé.1: Stabilité Financière
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Codes de classification JEL : C33, G21, G28.

Cette recherche étudie les effets de la réglementation prudentielle et de la pression des autorités sur la stabilité bancaire et financière représentée par l'indice z-score. En utilisant de nombreuses techniques d'estimation de données de panel, nous avons utilisé un échantillon de 10 banques opérant dans le système financier algérien sur la période 2010-2020. Utiliser des variables telles que la rentabilité bancaire; solvabilité du capital; taille et liquidité des banques. Les résultats empiriques concluent que l'indice de solvabilité n'est pas significatif. La taille et la liquidité des banques influencent négativement la stabilité du système financier. De nombreuses études empiriques aboutissaient aux mêmes conclusions. Cette étude souligne également l'importance des mesures d'autorité prises par la Banque d'Algérie telles que les réserves obligatoires; solvabilité du capital et réformes du système bancaire.

Corresponding Author: Zouaouia Hallam Email: z.hallam@yahoo.fr

1. INTRODUCTION

One of the key issues in contemporary economies is financial stability and how prudential requirements affect bank conduct. In light of the last financial crisis (2008) and the impact of recent COVID-19 on liquidity flexibility; for both depositors and borrowers. The prudential regulatory framework places a strong emphasis on the board and senior management of financial institutions duty to steer clear of financial risks as well as high-level principles of sound financial and business practices. This strategy gives financial system enough flexibility while guaranteeing a regulatory framework that is more resilient to changes in the market. Risk management and prudential regulation, including credit and liquidity issues, have been the subject of several empirical research.

The global financial regulatory framework has undergone significant changes as a result of the financial crisis. A large portion of this reform was a direct reaction to the flaws of the pre-crisis system. In general, the legislation has come to light as a final answer to safeguard creditors' safety and the financial system. It is true that bank regulation is a crucial idea that ensures bank stability; therefore, prudential regulations and banking laws must establish a framework that encourages banks to conduct themselves responsibly and safely, and the regulatory and supervisory framework must offset the distortions brought about by public sector guarantees. Therefore, prudential regulation's objectives are viewed as a way to validate the financial system. This necessitates a uniform set of regulations controlling asset valuation, accounting, and supervisory reporting.

We tried in this paper to answer the question about what's role does prudential regulation plays in financial and banking stability?.

For the problem purpose, we divided this paper into two parts, first one aboard theoretical framework and empirical studies who's elaborate relationship between prudential regulation and institutional requirements as a pillar of financial stability, and in the second part we tried to run a regression panel model for a sample for 10 Algerian banks; several results was obtained and we concluded by improving the importance of institutional regulatory in financial stability.

2. Literature Review

Three Basel accords appeared publicly for the first time since 1988 (Basel I); the second on 2004 named (Basel II); and since 2010 the third (Basel III) following the global financial crisis on 2010 and reviewed in 2017.

Previous examinations investigating the impact of prudential capital regulation on bank's behaviour. Conflicted findings found from theoretical and empirical researches. Banking sector plays an important role in

economic development and influences financial stability, economic growth, and economic opportunities. Financial crisis of 2008 has highlighted the importance of the bank regulation. (Dongwei, Yifan, Yifan, & Xin, 2023, pp. 1-2)

Financial stability analysis may not be considered new, but it is a broad and complex concept that did not find a unified consensus on its conceptual and theoretical framework in general except with the increasing intellectual contributions and practical experiences of specialists and decision makers in light of the experiences of financial and economic crises and the changing circumstances witnessed by the international financial system. Especially after it was actively discussed in the wake of the 2008 crisis, its concept was coupled with the systemic risk approach, and its analytical and conceptual framework, at least, became widely accepted according to this approach. Then, its relationship with macroprudential analysis, as it is today, is the result of understanding the nature of systemic risks and the precautionary (preventive) policies they require to mitigate their severity. Although financial stability includes not only preventive dimensions, but even curative dimensions.

Basel I and Basel II accords in 1988 and 2004 respectively; contributed to the establishment of the worldwide banking requirements.

Basel III Accord organized its recommendations into three basic pillars, the first of which deals with minimum capital requirements. The second relates to banking supervision, while the third axis is specific market discipline and disclosure. (Diego, Iluminada, & David, 2024, p. 2)

The Basel III agreements of 2010 and its 2017 revision emerged as results of the financial crisis (2008). Hedging requirements imposed to maintain the flexibility of the financial system and avoid systemic risks, as a result contributing in stability of the international financial system. (Scalco, Tabak, & Teixeira, 2021, p. 2)

Hedging financial regulation contains a set of general principles in addition to legal rules, which it reduces the possibility of individual banks going bankrupt and contributes to improving the performance of financial institutions and markets. (Dimitri, 1991) and (Rodrigo & G.V, 1979)

Large stand of literature investigates relationship between financial stability and bank regulation, (Heid, Porath, & Stolz, 2003); (Roy, 2005); (Saadaoui, 2010); (Lin, Hwang, Wang, & Xie, 2013); (Ahamed & Mallick, 2019); (Rahman, 2021) and (Dongwei, Yifan, Yifan, & Xin, 2023) used the z-score index as measurement of risk-taking and this due to check the robustness of the international financial system.

The findings of (Oslo, 2022) that investigate Banking weather in Kenya; analyzing the impact of prudential regulation on stability of banking system. The empirical study measures how can (capital adequacy requirements;

asset quality requirement ratios; liquidity requirement ratios) affect stability of commercial banks in Kenya. Chosen a sample of all 43 Kenyan commercial banks. Using a descriptive method, the study results had a significant correlation between asset quality, capital sufficiency, and liquidity requirements. As a result this study had improved the crucial role of those prudential regulations on the stability of banking system in Kenya.

Over world, financial institution operates under extensive government supervision and regulation. The establishment of an appropriate regulatory framework is essential to ensure that government supervisors can carry out and enforce their responsibilities. (Vincent & Polizatto, 1990) These regulatory structures seek to prevent, limit or stop the damage caused by poor management.

2.1. Prudential regulation and Financial Stability in Basel Recommendations

In order to supervise banking activity and ensure greater precaution measures and hedging; the (BCBS) - Basel Committee on Banking Supervision- sets international prudential regulation standards. Since 1988, the first Basel agreement (Basel I) was a huge jumping step in the global financial system based on regulation of capital-risk. Basel-I's primary goals were to monitor banks' credit risk and establish minimum capital requirements for banks that operate globally.

(Rahman, Mohammad M; Chowdhury, Ali, A; , 2018) As financial markets continued to globalize and banking practices evolved, requirements to Basel I standards became indispensible.

After evaluating the shortcomings for the previous both Basel one and two by (BCBS) to find solutions and address them. The Basel III standards were presented and confirmed by (BCBS) since 2010 and revised in 2017. The Basel I and II capital accords were criticized for a variety of reasons (Rahman, Mohammad M; Chowdhury, Ali, A; , 2018). This was finalized with another number of revisions between December 2017 and 2019. Basel-III enhanced the quality and amount of risk-based capital regulation. The Basel II framework is improved by Basel III through: (Moody's, 2011)

- Greater and higher quality of capital;
-More stringent standards for measuring liquidity risk;
-New arrangements forward-looking provisioning for credit losses;
- Additional requirements to reduce systemic risk.

The revised package without appreciably raising capital requirements globally, Basel III seeks to insure comparability between banks capital

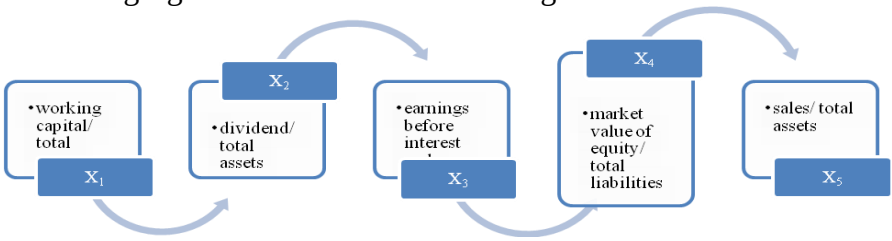
levels and restore credibility in the fact of risk-weighted assets. (Treasury, 2020)

This study focuses on research that examines the connection between financial stability and banking regulation.

For the research purpose we proxied financial stability by the z-score index, who's created by Altman in 1968 as a first index with several variables; it was a real contribution valuating financial robustness and possibilities of failure and bankruptcy. Z-score index was built on data of 86 entities over the period of 1946-1965; so Altman relied on the following formula:

$$Z = 1.2\,X_1 + 1.4\,X_2 + 3.3\,X_3 + 0.6\,X_4 + 1.0\,X_5$$

The following figure shown variables meaning:



Meaning of the Z-score called Altman index if results were lower than 1.8, in particular indicates that the company is on the way of bankruptcy. So companies' with scores above 3 are unlikely to enter bankruptcy. Scores between the value of 1.8 and 3 are defined as a gray zone. (Morten, 2011, pp. 14-16)

3. Algerian Institutional Background

Establishing an appropriate regulatory framework is essential to ensure that government supervisors are able to carry out their responsibilities; prudential regulations set external limits and requirements given to the banking system. The no existence or weakness of precedent measures can affect severely the financial system and may lead to their failure and instability.

Commercial banks are active in the Algerian banking sphere; there are banks with private capital and others which had public capital. Bank of Algeria (BA) is the greater authority of the Algerian financial system.

Next table highlights types of Algerian banks and financial institutions.

Table 1: Existing Financial Institution in Algeria

Commercial Public Banks	Active Commercial Private Banks	Financial Institutions	Representative office
•BADR	•Al-BARAK BANK	•CNMA	•BACB
•BEA	•ABC BANK	•SOFINANCE	•UBAF
•BDL	•NATIXIS BANK	•SRH	•CIC
•BNA	•Société Générale Bank	•ALC	•BANCO SABADELL
•CNEP Bank	•CITI Bank	•MLA	•MONTE DEI PASHI DI DIENA
•CPA	•Arab Bank	•SNL	•CAIXA BANK
	•BNP Paribas	•ILA	
	•TRUST BANK	•EDI	
	•GULF BANK		
	•HBTF BANK		
	•FRANSA BANK		
	•GROUPE CREDIT AGRICOLE		
	•AL SALAM BANK		
	•HSBC BANK		

Source: (Bank of Algeria B. , 2023)**;** (Azzi, Mesaoudi, & Zelaci, 2021, p. 313)

As shown in the table above financial environment is contributed from 20 commercial bank and 8 financial institutions. Next table shows the ratio of minimum reserves required by the highest financial between (2000-2023)

Table 2: Reserve Requirement Ratio (2010-2023)

Year	**2010**	**2011**	**2012**	**2013**	**2014**
Ratio %	9 from 12.15	9	11 from 05.15	12 from 05.15	12
Year	**2015**	**2016**	**2017**	**2018**	**2019**
Ratio %	12	8 from 05.15	4 from 08.15	8 from 01.15	12 from 02.15
Year	**2019**	**2020**	**2020**	**2020**	**2021**
Ratio	10% -15 Dec-	8% -15 Mar-	6% -05 Mai-	3% -15 Sep-	2% -15 Feb-
	2022	**2023**			
	2%	3% -15 Apr-			

Source: (Bank of Algeria B. , 2023)

The minimum reserve requirement in article number 05 was established by "order number 04-02 of the 4th April 2004"; it cannot be greater than 15% or equal to 0%. One month is allotted for required reserves. It starts on 15th of every month and end on 14th from the next month according to the Algerian official journal. (JORADP, 2004)

4. Sample and Methods:

In this paper, it was relied on the financial statements of (10) banks exercising in the Algerian financial environment, in order to apply selected model standards and obtain results. The appropriate chosen Algerian banks

are " External Bank of Algeria (BEA); National Bank of Algeria (BNA); Arab Banking Corporation (ABC Bank); The Bank of France (FransaBank); (Gulf Bank); (Société Générale Bank); (Al-Salam Bank); Popular Credit Bank (CPA); (Trust Bank) and (Albaraka Bank). These selected sample contain both public and private banks. collected financial statements of the chosen banks which are publicly published, and we selected the period from 2010 to 2020 the lasted year for which data are available.

4.1. Data

Variables used in the empirical study are annual. For the study purpose balanced panel data structure was tested. Model of panel data consist cross-section data of the previous (10) selected banks, and time series from 2010 to 2020. Other Algerian banks either public or private banks are not considered because we can't complete all time series necessary for the study period. Published financial statements and Bank's balance sheets found on bank's websites are collected; also additional statistics from Bank of Algeria are used. Empirical results were obtained from software's such as Eviews and Microsoft Excel.

4.2. Main Variables:

4.2.1. Financial stability Index:

Extant literature has used several variables to measure financial stability, in this paper we employed data for resilience measurements, proxied by the bank Z-score index. (Morgan & Pontines, 2018), (Ahamed & Mallick, 2019), (Duc, Nhan, & Loan, 2021) The following formula of the z-score index was adapted for banks and financial institution:

$$Z = (K_{t:q})/\sigma_{t:q}$$

Which: $K_{t:q}$ refer to $\frac{(capital+reserves)}{assets}$

$U_{t:q}\frac{(return\ average)}{assets}$

$\sigma_{t:q} sd\ Dev \frac{returns}{assets}$

$Z-score$ has become a popular measure of individual bank risk and soundness, it's great importance due to the reality that the ratio was inversely related to the probability of bank's robustness and insolvency. (Maechler, Srobona, & Delisle, October 6-7, 2005) & (Martin & Heiko, 2008).

The z-score can be summarized as z=(ROA+ (equity/assets)) /standard deviation of ROA. (Martin & Heiko, 2008); (Morgan & Pontines, 2018); (Duc, Nhan, & Loan, 2021); and others.

4.2.2. Prudential regulation measurement:

To capture the impact of regulatory pressure and prudential requirements on capital, from the Basel Accord, this might influence

funding levels and level of risk. This variable was adopted by (Heid, Porath, & Stolz, 2003), (Roy, 2005), (Saadaoui, 2010) and (Maghni, 2017, p. 47) it can takes two possible values and in the most used because it takes into account the volatility of equity. Results of those research conducted that the increase in capital is an expensive operation, shareholders prefer to hold in excess of the minimum amount required by the prudential and regulation in force when these funds are very volatile. For that if at the end of a year a bank displays a solvency ratio it will be very likely that during the next year, the bank risked disciplinary measures of order. The prudential regulation variable is calculated as follows:

$$REG = (Min_{REG} + \sigma CAR) - CAR$$

4.2.3. Solvency Ratio:

An adequacy of regulatory capital as the solvency ratio CAR was added to the econometric model. It is a ratio measuring the prudential equity of the bank and assets. As shown (Powell, 2004), (Lin, Hwang, Wang, & Xie, 2013) and (Maghni, 2017). Solvency ratio explores significantly the level of the bank capital; as known it was applied by most financial systems since it was adopted in 2004 (Basel II). The CAR ratio reflects solvency of the financial structure considering bank's-risk. This ratio was calculated by the comparison between capital and risk weighted asset, CAR ratio must be equal or up than 9.5%. (Bank of Algeria, 2014)

$$CAR = \frac{Capital\ (Net\ prudential)}{Risk\ Weighted\ Asset}$$

4.3. Control variables:

4.3.1. Banks Profitability measured by (ROA):

The return on asset is evaluated and calculated as a of $net\ income/\ total\ assets$. Since a bank's earning level is a key source of capital, banks may raise money internally, and it is expected that the profit by level index will have a positive and significant impact on banks' objective capital level. (Zhang, Wu, & Liu, 2008), (Rahman, 2021).

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

4.3.2. Bank Size:

We incorporate the logarithm of total assets $(Ln\ of\ total\ assets)$ to stabilize it and as account for bank size. Numerous research have demonstrated that big banks may either be dangerous or stabilizing for the system of financial stability. (Maechler, Srobona, & Delisle, October 6-7, 2005, p. 18) We used measures of the bank as an important standard to determinate the bank risk-taking, thus large banks had lower capital ratio then smaller banks.

4.3.3. Liquidity:

Loans and advances make up a $percentage\ (\%) of\ total\ assets$. In the equation, we incorporate the $ratio\ of\ total\ loans/\ total\ assets$ (LIQ). Interpretation of this index said if a greater level of ratio was found, the liquidity corresponds to higher investment in risk-weighted assets. (Roy, 2005), (Rahman, 2021) The variable was calculated as follow:

$$LIQ = \frac{Total\ Loans}{Total\ Assets}$$

4.4. Econometric model:

We based on a regression model, which demonstrated the relationship between prudential regulation and financial stability. We put variables on the static-panel equation:

$$z - score_{it} = a + \beta_1 ROA_{it} + \beta_2 REG_{it} + \beta_3 CAR_{it} + \beta_4 SIZE_{it} + \beta_5 LIQ_{it} + \varepsilon_{it}$$

$$i = 1, \dots, N \text{ and } t = 1, \dots, T$$

Where the $Z - scoreit$ considered as dependent variable; means that banking and financial system are stable and robust. Other independent variables as:

$ROAit$ means the return on assets for the chosen banks.

$REGit$ refer to the prudential regulatory pressure in the financial Algerian environment.

$CARit$ measure the capital adequacy ratio.

Control variables to establish relationship between variables included:

$SIZEit$; the logarithm of total assets of banks.

$LIQit$; the liquidity indicator.

β coefficient represents a list of nuisance parameters;

εit is the error term; $i = 1, \dots, N$ refer to the number of banks; and $t = 1, \dots, T$ correspond to the study period (2010-2020). All variables are obtained from the annual financial statements and reports.

Table 3: structure of the variables

Variables	Definition	Source
Z-score	z-score=ROA+EA/σROA	(Ahamed & Mallick, 2019); (Dongwei, Yifan, Yifan, & Xin, 2023); (Heid, Porath, & Stolz, 2003); (Saadaoui, 2010)
Prudential Regulation	REG=(Min REG+σCAR)-CAR	(Heid, Porath, & Stolz, 2003); (Saadaoui, 2010); (Awdeh, El-Moussawi, & Machrouh, 2011); (Maghni, 2017)
Solvency Ratio	CAR is the capital (prudential) on weight of debt for a bank	(Shrieves & Dahl, 1992); (Wall & Peterson, 1995); (Arellano & Bond, 1991);

		(Maghni, 2017)
Profitability Ratio	ROA= net income/ total assets	(Barell, Davis, Dilruba, & Liadze, 2010); (Klomp & Haan J, 2012)
Liquidity ratio	LIQ= total loans/ total assets	(Klomp & Haan J, 2012); (Salhi & Boujelbene, 2014)
Size of the Bank	$Size = ln\,(total\ assets)$ calculated by the natural logarithm of total assets	(Berger & Udell, 1995); (Maechler, Srobona, & Delisle, October 6-7, 2005); (Rahman, 2021)

Source: Compiled by the author.

5. Empirical results:

5.1. Descriptive statistics:

Next tables number four and five shown descriptive statistics and correlations respectively, of model variables used in the empirical study.

Table N°4 report descriptive statistics about variables; dependent variable $Z - score$ has a mean of (2.83) with a maximum of (3.83) and minimum of (1.91). ROA mean is (6.44), the maximum is (8.86) and minimum of (2.71).

But the REG mean is (1.75) with an interval of the $[071 - 2.13]$.

CAR mean equal to (0.79), and his interval is between $[0.35 - .097]$. Calculated mean is lower than 9.5% defined by regulation authorities in Algeria. Finally $SIZE$ has a mean of (2.61), and the mean of LIQ is about (2.81). Observations are 110, which refer to the 10 Algerian Bank branches and 11 years from 2010 to 2020.

Table 4: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
Z_SCORE	2.835397	2.721137	3.836187	1.916869	0.392391	110
ROA	6.443501	6.482394	8.86136	2.713099	1.457635	110
REG	1.751792	2.375212	2.137690	0.710118	0.981809	110
CAR	0.793712	0.823949	0.978435	0.351831	0.164548	110
SIZE	2.611412	2.554384	4.582543	0.408356	0.008028	110
LIQ	2.819812	2.948679	3.946760	1.075114	0.607887	110

Source: $Eviews\ 10$ Outputs

5.2. Results of correlation statistics:

As showed in the table N° 5, very low correlation coefficient between variables. This can be interpretated that there is very low level of multicollinearity which is not important in our empirical study.

Table 5: Correlation between variables

Variables	*Z_Score*	*ROA*	*REG*	*CAR*	*SIZE*	*LIQ*
Z_Score	1					
ROA	0.242047	1				
REG	0.028322	0. 22122	1			
CAR	-0.036656	0.254620	-0.027583	1		
SIZE	0. 78504	0.650352	0.0001789	0.087123	1	
LIQ	0.455469	0.365276	0.788724	0.752145	-0.210486	1

Source: Eviews 10 outputs

5.3. Model empirical results:

The table N° 7 highlights the panel regression results. Using Fixed Effect Model (FEM) and Random Effect Model (REM) techniques. We estimated influences from prudential regulation and requirements on banking robustness reflected financial stability in the Algerian bank's environment.

The model selection $criterion$ is based on the $Hausman\ test\ statistics$. If $P-value < 5\%$ this confirmed that the null hypothesis should be rejected; so the $(random\ effect\ model)$ is accepted.

5.4. Hausman test for Model Specification

The Hausman specification test was used in the study to select the best regression model between a random effects and fixed effects regression model. The null hypothesis in Hausman test states that the difference between the coefficients is not consistent implying that a random model is the best.

Table 6: Hausman test for results of the model specification

Test Summary	*Chi − Sq Statistic*	*Chi − Sqd. f*	*Probability*
Cross − section random	6.0793736	6	0.41134

Source: Results obtained from Eviews 10

Hausman test results indicate a $prob > chi^2 = 0.41134$, the value greater than $P\ value\ at\ 5\%$ level of significance. Discussion about results refers that H_0 (null hypothesis) equal to a random effect model is the best; and alternative hypothesis was rejected. An (REM) regression model was chosen.

The (REM) has heteroskedasticity and multicollinearity problems, which make it impossible to estimate the standard errors precisely, according to the results of model specification tests.

Creating inaccurate hypothesis testing on the importance of calculated coefficients as a result. Therefore, the Feasible Generalized Least Squares

$(FGLS)$ regression is used as the (REM) solution in order to estimate these errors and improve the model's robustness.

The $(FGLS)$ estimation for regression results are displayed in the table below.

$Z-score$ is dependent variable, the model is more significant. Independent variables ROA; REG; CAR; $SIZE$; and LIQ are among the variables that are significant at the 1% and 5% levels.

Table 7: Effects of prudential regulation on financial stability in Algerian Banks

	Bank Z-score		
	FEM	**REM**	**FGLS**
ROA	0,10325***	0.07231***	0.0898***
	(2,6707)	(6.5296)	(3.4609)
REG	0.1602**	0.1723***	0.1939***
	(1.6087)	(8.2497)	(3.0664)
CAR	-0.0066**	0.0528***	-0.0221
	(-1.8238)	(8.7248)	(-0.8783)
SIZE	0.0451	0.2211***	-0.0762*
	(0.4061)	(4.3171)	(-1.3357)
LIQ	-0.8001	-0.1733	-0.8262*
	(-0.6605)	(-4.3171)	(-1.4745)
Con_	3.4279***	1.3907***	3.69411***
	(2.3295)	(3.4251)	(4.02752)
Number of obs	110	110	110
F-statistic	39.4042	35.8471	67.2326
(P_value)	0.0000	0.0000	0.0000
R-square	0.8036	0.8416	0.8008

$***,**,*$ *are significant levels at* $1\%, 5\%,$ *and* $10\%,$ *respectively.*
$T-$ *statistics are in parentheses.*

Source: Eviews 10 outputs

6. Study results and discussion

A greater R-squared which reached (0.8008) is translated as dependant variables (bank profitability, prudential regulatory, bank solvency, bank size and bank liquidity); all they possessed a high z_{score} explaining capacity on the financial stability in the Algerian banking system. At the less than 5% *level*, *the* $F-statistics = 67.2326$, and $p-value = 0.000$. Those results improve that prudential regulatory had significant effects on the stability of Algerian banks.

Also table 7 shows that ROA has a significant value at 1% *level* and influence financial stability positively by (0.0898%); that's mean that positive index can improve financial stability. Also the adoption of REG who's also significant at (0.01) can impact financial stability by (0.1939%).

Finally, empirical results conclude that the respect of prudential regulation as the reserve requirements can reinforce and make the financial system more robust. Several empirical findings conducted by many researchers have confirmed our results.

The index of solvency represented by CAR has no significant impact on through the financial stability, results are not significant.

Size and LIQ are both at 0.1 level, but influence financial stability negatively by (-0.0762) and (-08262) respectively. Many findings result shows that smaller financial institution can be quickly influenced by financial crises over world. Negative coefficient for liquidity, aim to the real needs of the Algerian financial market in liquidity, hence the Algerian system is not mature In digital transactions.

We noticed also that characteristics of the financial system in Algeria can reverse results. Financial system in Algeria is not open into the international financial system, and Algeria had also may difficulties in the informal currency exchange market.

7. CONCLUSION

Prudential regulations and requirements stipulate several standards that contribute in the robustness of the international financial system. Precautionary measures as the indicators of the capital reserves; flexibility of liquidity; or loan's portfolio diversification standards; limitations on a bank's investment portfolio; and other restrictions aimed at limiting and hedging from risks which a bank may undertake, to operate effectively during periods of economic crisis without causing damage to their customers, or imbalances in financial system. (Treasury, 2020)

Accordingly, according to the precautionary policy based on capital instruments, and by moving from a partial precautionary policy to a policy

Total prudential since 2014, after including both market and operational risks in calculating capital ratios within Basel II, and even through Basel III in determining the value of the financial safety cushion or additional capital requirements that can be applied to institutions of systemic importance, even if the estimated capital level differs. (9.5%) by the Bank of Algeria compared to its estimated level within Basel III of (10.5%)

These high rates, especially the high-quality base rates (exceeding 7%) stipulated in Basel III, remain a positive indicator for maintaining financial stability in Algeria during this period. Therefore, even if the adoption and implementation of Basel II within the Algerian banking system was delayed, the regulatory frameworks related to raising the minimum capital Money is an important factor in banks' adaptation to the established prudential standards, including the 2008 framework or even the 2018 framework, which will have the same role in compliance. For the established Basel III axes.

Algerian financial system is subject to considerable changes at the end to be integrated in the international finance. The empirical results elaborated by our study shown the highest importance of the model variables chosen in the study (prudential regulation; profitability and solvency of banks; their size and liquidity) on weather of financial stability in Algeria. According to (Dongwei, Yifan, Yifan, & Xin, 2023), respect of the prudential requirements can avoid financial risks.

Hence an existence of bank's solvency and respect of minimum capital by active banks and financial institution could maintain the stability of banking and robustness of the financial system.

Empirical findings obtain that Algerian financial system is really stable more because of other elements as political decisions and the not connection by the international financial system. Algerian authorities dealed very well with financial crises, as the latest liquidity crises dued by the Covid 19. Hence the financial system is not really digitalized.

Our findings revealed that prudential regulatory can effect financial system. This result may be explained also by caution of the Algerian financial authorities and the measures of the Bank of Algeria.

The banking sector in Algeria has clearly improved in the last decade, as it was not directly affected by the 2008 crisis. In addition, various reforms, especially after the establishment of the new regulatory framework in 2008, which includes the minimum capital for banks and financial institutions, have led to private banks strengthening their own funds starting from December 2009. Public banks have also strengthened their minimum capital before 2010.

The highest authority of Algeria determines annually many indicators shown financial soundness in Algerian banks. However, there are many challenges facing Algerian banks, such as the inadequacy of regulatory measures in terms of infrastructure technologies and digitalization of the financial system. Important procedures are token by the supervisory authorities. Also the lack of regulatory analysis risk management. And capital adequacy, also we can't forget the general weakness in the infrastructure necessary to implement Basel III standards.

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